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Jeff B. Pelz

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Gunnar G Leinberg

Nixon Peabody LLP

Clinton Square

P O Box 31051

Rochester, NY 14603-1051

EXAMINER

WILSON, JACQUELINE B

ART UNIT

PAPER NUMBER

2612

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/545,577

Applicant(s)

PELZ, JEFF B.

Examiner

Jacqueline Wilson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed 11/22/04 have been fully considered but they are not persuasive.

The applicant argues that the prior art fails to disclose or suggest applying a different filter to each of the RGB pixel signals (p. 10 of applicants remarks, first and second paragraphs). The examiner strongly disagrees. As shown in fig. 7, Kudo et al'961 teaches applying a median filter (34) for the set of green pixels, an average-interpolation filter (31) for the set of red pixels, and an average-interpolation filter (31) for the set of blue pixels. These are interpreted as different filters to each of the sets of pixel data signals. The applicant further argues that the prior art fails to teach applying a color-space transformation to the sets of pixel data signal before the step of applying a filter as claimed in claims 7 and 24 (p. 11 of applicants remarks, first and second paragraphs). However, Spaulding et al'213 is used to teach color-space transformation for correcting multi channel signals and would further be useful to use this transformation prior to filtering for the purpose of generating accurate signals and easier detection of defective signals. As for Claims 10, 24, and 38, it is notoriously well known in the art to transform RGB signals into achromatic and chrominance channels. This is normally performed before additional processing of the image signals. Official Notice is

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taken for this fact. Reference in the previous office action was also directed towards Aoki et al (US 6,628,327) which supports this fact (specifically fig. 5).

In addition to the above, the applicant argues that the prior art fails to teach identifying the pixel data signals in each set of pixel data signals with at least a first characteristic and restricting the application of the filters to the unidentified pixel data signals in each set of pixel data signals. The examiner disagrees. Kudo et al'961 teaches identifying the pixel signals with a first characteristic such as reducing to zero the signals other than G, R, and B pixels (col. 7, lines 37+). The examiner also believes Kudo et al'961 teaches restricting the application of the filters to the unidentified pixel data signals in each set of pixel signals in the masking step (#10). This masking step only processes pixel signals as shown in fig. 7. On page 13, first paragraph of the applicant's remarks, the applicant focuses on teachings in the interpolation step (#15). However, the examiner has not relied on this step in addressing Claims 8, 15, 17, 33, 40, and 42.

Therefore, the rejections of Claims 1-43 are maintained. Please see discussion of newly added claims 44-46 below.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**2. Claims 1-3, 6, 8-12, 15-20, 23, 25-27, 29-31, 33-36, and 38-45 are rejected under 35 U.S.C. 102(e) as being anticipated by Kubo et al. (US 6,686,961).**

Regarding Claim 1, Kubo et al teaches providing digital image (Fig.3, element 6), the digital image comprising a plurality of channels (fig. 7 shows R, G, and B separated for further processing) with each of the channels comprising a set of pixel data signals, and applying a filter to each of the sets of pixel data signals (34 and 31), and applying a different filter to each of the sets of pixel data signals (col. 7, lines 57+). As shown in fig. 7, Kudo et al'961 teaches applying a median filter (34) for the set of green pixels, an average-interpolation filter (31) for the set of red pixels, and an average-interpolation filter (31) for the set of blue pixels. These are interpreted as different filters to each of the sets of pixel data signals.

Regarding Claim 2, Kubo et al teaches replacing the individual pixel within the set of pixel data with a median pixel data signal derived from a median value of adjacent pixel data signals within a set radius around the individual pixel data signal (col.7, lines 65-col. 8, lines 23; also fig. 7 show the replaced pixel is output from the filters).

Regarding Claim 3, Kubo et al teaches that the set radius is different for the different filters (element 34 uses the two midmost values such as directly above, below, on the right of, and on the left of the central pixel [col. 7, lines 58-64] and element 31 uses all of the signal values [col. 8, lines 10-15]).

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Regarding Claim 6, Kubo et al teaches the plurality of channels comprises a red channel, a green channel, and a blue channel (see fig. 7, 47).

Regarding Claim 8, Kubo teaches identifying the pixel data signals in each set of pixel data signals with at least a first characteristic and restricting the application of the filters to the unidentified pixel data signals in each set of pixel data signals (referred to as masking; fig. 7, step #10).

Regarding Claim 9, Kubo et al teaches the first characteristic is noise at or above a first threshold level (col. 7, lines 48+ discloses reducing to 0 the signals other than G, R, and B pixels). This indicates any signals not meeting the G, R or B level will be reduced to zero and not applied to the filter.

Claim 10 is analyzed and discussed with respect to Claim 1, with the further limitation of transforming red, green, and blue channels to an achromatic and two chrominance channels. However, it is notoriously well known in the art to change RGB signals to R-G, B-G, and Y channels (also known as Cr, Cb, Y). (Official Notice)

Claim 11 is analyzed and discussed with respect to Claim 2. (See rejection of Claim 2 above.)

Claim 12 is analyzed and discussed with respect to Claim 3. (See rejection of Claim 9 above.)

Claim 15 is analyzed and discussed with respect to Claim 8. (See rejection of Claim 8 above.)

Claim 16 is analyzed and discussed with respect to Claim 9. (See rejection of Claim 9 above.)

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Claim 17 is analyzed and discussed with respect to Claims 1 and 8. (See rejection of Claims 1 and 8 above.)

Claim 18 is analyzed and discussed with respect to Claim 9. (See rejection of Claim 9 above.)

Claim 19 is analyzed and discussed with respect to Claims 1 and 2. (See rejection of Claims 1 and 2 above.)

Claim 20 is analyzed and discussed with respect to Claim 3. (See rejection of Claim 3 above.)

Claim 23 is analyzed and discussed with respect to Claim 1. (See rejection of Claim 1 above.)

Claim 25 is analyzed and discussed with respect to Claim 1. (See rejection of Claim 1 above.)

Claim 26 is analyzed and discussed with respect to Claim 2. (See rejection of Claim 2 above.)

Claim 27 is analyzed and discussed with respect to Claim 3. (See rejection of Claim 3 above.)

Claim 29 is analyzed and discussed with respect to Claim 10. (See rejection of Claim 10 above.)

Claim 30 is analyzed and discussed with respect to Claim 11. (See rejection of Claim 11 above.)

Claim 31 is analyzed and discussed with respect to Claim 12. (See rejection of Claim 12 above.)

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Regarding Claim 33, Kubo et al teaches an image sensor apparatus (fig. 3) for capturing a digital image (6), comprising a plurality of channels with each of the channels comprising a set of pixel data signals (see input signals in fig. 7), a masking system (fig. 7, step #10 which obtains image signals from the memory 20) which identifies the pixel data signals in each set of pixel data signals with at least a first characteristic (col. 7, lines 48-51), and a filter system (fig. 7, step #20) applying a filter to the unidentified pixel data signals in each of the sets of pixel data signals.

Claim 34 is analyzed and discussed with respect to Claim 9. (See rejection of Claim 9 above.)

Claim 35 is analyzed and discussed with respect to Claims 1 and 2. (See rejection of Claims 1 and 2 above.)

Claim 36 is analyzed and discussed with respect to Claim 3. (See rejection of Claim 3 above.)

Claim 38 is analyzed and discussed with respect to Claim 10. (See rejection of Claim 10 above.)

Claim 39 is analyzed and discussed with respect to Claim 33. (See rejection of Claim 33 above.)

Regarding Claims 40 and 42, Kubo et al teaches capturing the digital image with a sensor (fig. 3, element 3), identifying pixels in a set of pixels for the sensor with a first characteristic (processing pixels other than G, R and B pixels), storing a map of the identified pixels for the sensor (see fig. 7, step #15) and restricting the application of the



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filters to the pixel data signals in the unidentified pixels in the set of pixels for the sensor (referred to as masking (col. 7, lines 48+).

Claims 41 and 43 are analyzed and discussed with respect to Claim 9. (See rejection of Claim 9 above.)

Claim 44 is analyzed and discussed with respect to Claims 1 and 10. (See rejection of Claims 1 and 10 above.)

Claim 45 is analyzed and discussed with respect to Claims 1 and 10. (See rejection of Claims 1 and 10 above.)

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claim 4, 5, 13-14, 21-22, 28, 32 and 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo et al in view of the applicants conceded prior art.**

Regarding Claims 4 and 5, Kubo et al does not specifically disclose adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least one factor which is a duration of exposure for capturing the digital image. However, the applicants conceded prior art teaches an exposure of 15 seconds (fig. 3) at a set radius. It would have been obvious to one having ordinary skill in the art that the radius is set according to exposure since the longer the exposure the more

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noise is likely to increase with defective pixels. This would require more of an area of correction. Therefore, it would have been obvious to one having ordinary skill in the art to include adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least a duration of exposure for capturing the digital image.

Claims 13 and 14 are analyzed and discussed with respect to Claims 4 and 5.

(See rejection of Claims 4 and 5 above.)

Claims 21 and 22 are analyzed and discussed with respect to Claims 4 and 5.

(See rejection of Claims 4 and 5 above.)

Claim 28 is analyzed and discussed with respect to Claim 4. (See rejection of Claim 4 above.)

Claim 32 is analyzed and discussed with respect to Claim 4. (See rejection of Claim 4 above.)

Claim 37 is analyzed and discussed with respect to Claim 4. (See rejection of Claim 4 above.)

**5. Claims 7, 24 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo et al in view of Spaulding et al. (US 5,805,213).**

Regarding Claim 7, Kubo et al fails to specifically disclose using a color-space transformation to the sets of pixel signal before the step of applying a filter. However, Spaulding et al teaches it would be advantageous to use, for example, CIELAB for the purpose of correcting the multi channel signals of the camera system to produce the

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desired output signals (col. 8, lines 53+; and col. 7, lines 63+). This would be useful before performing the actual filtering process so that an accurate signal would be produced and detection of the defective signals would be easier to detect. Therefore, it would have been obvious to one having ordinary skill in the art to use color-space transformation to the sets of pixel data signals before the step of applying a filter.

Claim 24 is analyzed and discussed with respect to Claim 7. (See rejection of Claim 7 above.)

Claim 46 is analyzed and discussed with respect to Claim 7. (See rejection of Claim 7 above.)

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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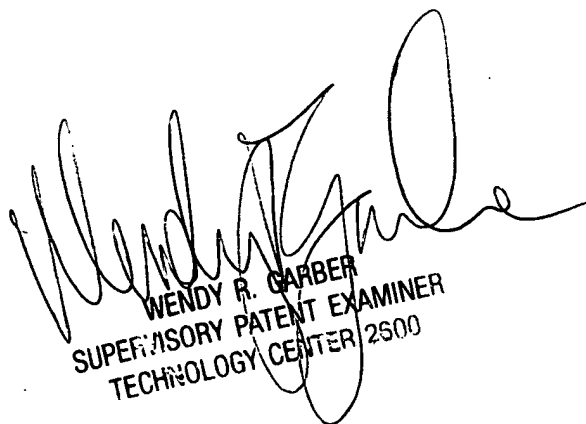
extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacqueline Wilson whose telephone number is (571) 272-7322. The examiner can normally be reached on 8:30am-5:00pm (alternate Fridays off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on (571) 272-7308. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JW  
05/06/05

  
WENDY R. GARBER  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2500